CLAIMS:

1. A fuel cell separator having gas supply grooves on one side or both sides thereof which is molded from a composition composed mainly of an electrically conductive carbon powder and a binding agent, wherein the electrically conductive carbon powder is present such that its particles longer than 50 μm at maximum in the major axis direction and longer than 30 μm at maximum in the minor axis direction along the vertical cross section of the fuel cell separator occupy more than 50% of the sectional area in the vertical direction.

2. A fuel cell separator having gas supply grooves on one side or both sides thereof which is molded from a composition composed mainly of an electrically conductive carbon powder and a binding agent, wherein said binding agent is contained in an amount of 10 to 50 parts by mass for 100 parts by mass of the electrically conductive carbon powder and the electrically conductive carbon powder is spherical or massive graphite having a mean particle diameter of 100 to 500 μm.

3. The fuel cell separator as defined in Claim 2, wherein the spherical or massive graphite has a bulk density higher than 0.6 g/ml.

4. The fuel cell separator having gas supply grooves on one side or both sides thereof which is molded from a composition composed mainly of an electrically conductive carbon powder and a binding agent as defined in Claim 2 or 3, wherein the electrically conductive carbon powder is present such that its particles longer than 50 μm at maximum in the major axis direction and longer than 30 μm at maximum in the minor axis direction along the vertical cross section of the

fuel cell separator occupy more than 50% of the sectional area in the vertical direction.

5. The fuel cell separator as defined in any one of Claims 1 to 4, which has a resistivity not higher than 20 mΩ·cm measured according to JIS H0602.

6. A process for producing a fuel cell separator having gas supply grooves on one side or both sides thereof from a composition composed mainly of an electrically conductive carbon powder and a binding agent, wherein said process comprising injection molding a mixture containing 10 to 50 parts by mass of a binding agent for 100 pars by mass of the electrically conductive carbon powder.

7. The fuel cell separator as defined in Claim 6, wherein the electrically conductive carbon powder is spherical or massive graphite having a mean particle diameter of 100 to 500 μm, and the spherical or massive graphite having a bulk density higher than 0.6 g/ml is used.

8. A polymer electrolyte fuel cell consisting of a plurality of unit cells connected together, each unit cell consisting of a pair of electrodes holding a polymer electrolyte membrane between them and a pair of separators holding the electrodes between them, said separator having passages molded thereon through which gas is supplied and discharged, characterized in that all or part of the separators in the fuel cells are those which are defined in any one of Claims 1 to 5.